UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL RISK MANAGEMENT RESEARCH LABORATORY
LAND REMEDIATION AND POLLUTION CONTROL DIVISION
26 W MARTIN LUTHER KING DR • CINCINNATI, OH 45268

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OFFICE OF
RESEARCH AND DEVELOPMENT

MEMORANDUM

SUBJECT: Review of the Phase III Remedial Action Plan (August 2016)
New Bedford, MA

FROM: Robert Ford, Research Environmental Scientist
Land Remediation and Pollution Control Division
Cincinnati, OH 46268

Steven Acree, Hydrologist
Ground Water and Ecosystems Restoration Division
Ada, OK 74820

TO: Ginny Lombardo and Elaine Stanley
USEPA, Region 1

As part of technical support to Region 1 for the former Aerovox Facility, we have reviewed the Phase III Remedial Action Plan – RTN 4-601, Former Aerovox Facility, New Bedford, MA (August 2016). A limited review of the Phase III Remedial Action Plan (RAP) was performed. As requested, the review focused on the OU3 remedial alternatives and selected alternative. The following comments are provided for your consideration.

1) Appendix C: Groundwater Modeling
It is noted that a groundwater flow model was developed for use in the remedy evaluations presented in the RAP. Ultimately, if some form of low permeability containment or in-situ permeable reaction barrier is employed for the remedy, the groundwater model will provide one tool for design and assessment of the remedial system. As such, it is recommended that the groundwater model be subjected to a more comprehensive review to better evaluate its reliability to support these objectives. The following issues that appear to limit the ability of the current model formulation to represent the actual conditions of groundwater flow:

a) The assignment of hydraulic conductivity values for the various formation units included within the model are based on a sparse set of slug tests or other evaluations for existing wells throughout the aquifer. As an example, the following wells delineate a north-south transect of locations within the overburden and bedrock aquifers immediately upgradient and parallel to the existing sheet pile wall: MW-15D, MW-15B, MW-07A, MW-07, MW-07B, MW-02A, MW-02, MW-02B, MW-17D, MW-17B and MW-32B. Based on review of the Phase II Comprehensive Site Assessment,

it appears that only three of these wells have been subjected to any testing to assess the ability of aquifer materials to transmit groundwater.

b) The lateral extent of the projected peat layer does not fully correspond with data from the site characterization effort (Phase II Comprehensive Site Assessment; September 18, 2015). Specifically, data from boring locations MIP45, MIP46 and MIP47 revealed no detectable peat interval. Given the observed locations of high contaminant concentrations that potentially migrate to the Acushnet River occurring in a north-south aerial band on the property that parallels the shoreline, it is important that the distribution of hydrogeologic units incorporated within the three-dimensional model domain represent site conditions. The construction of the model domain will influence the results of the model calibration, including the appropriate numerical value assigned to the vertical conductivity of the modeled unit containing peat.

c) Insufficient detail is provided to assess the quality of the steady-state model calibration results. While a comparison of observed and modeled groundwater elevation is provided (Appendix C, Figure 1-7), there is no accompanying documentation for the examined wells to facilitate evaluation of potential systematic bias that should be used to ascertain the adequacy of the assumed model domain construction.

2) Assessments of Remedy Effectiveness

Discussions of the effectiveness of the proposed remedial alternatives for overburden groundwater were not comprehensive. In general, the ratings are subjective and did not appear to fully consider the possible effects of each alternative on the harbor cleanup efforts. In fact, it is not clear that the selected remedial alternative for overburden groundwater (OU3B-4) will be as effective with respect to preventing contaminant migration to the river as indicated in the remedial action plan.

3) Performance of Permeable Reactive Barrier (PRB)

It is also noted that evaluations of the effectiveness of the PRB with respect to preventing migration of dissolved PCBs did not appear to consider the possibility that migration may be facilitated by dissolved organic material, potentially including the organic material proposed for inclusion in the PRB design. Based on estimated cost for the organic material component proposed for use in the PRB, it appears that this material may be activated carbon. However, no specifics were provided to assess how the PRB design mix was intended to treat the range of site contaminants. In addition, it appears that the PRB was conceptualized to be constructed using material with a hydraulic conductivity similar to or greater than that of the aquifer materials. In practice, this can be difficult to accomplish. If the hydraulic conductivity of the PRB is significantly less than the aquifer, groundwater elevations upgradient of the PRB will increase and likely result in additional contaminant migration from the overburden, through the bedrock, and into the harbor. Any design assessment should also consider a proportional loss of PRB permeability over time that will accompany ZVI corrosion. Given that this is a tidally-influenced system with a wide range of groundwater salinity, the ultimate performance of the PRB should be considered to be uncertain.

4) Bedrock Transport Pathway
The proposed selected remedy is dependent on adequate contaminant treatment in bedrock, since there would be no effort to prevent groundwater flow from bedrock to the river. Based on review of bedrock hydrology adjacent to the Acushnet River, it appears that a significant portion of the contaminated bedrock aquifer is in good hydraulic communication with the river. With respect to control of contaminant migration from the site to the harbor, it would appear that a low permeability vertical barrier extending some depth into the bedrock and combined with groundwater extraction for hydraulic gradient control, as included in Alternative OU3B-3, could be significantly more effective than the proposed PRB.

Please contact Robert Ford (513-569-7501) or Steve Acree (580-436-8609) if you need clarification or have questions concerning our comments.

cc: John McKernan, ETSC Director